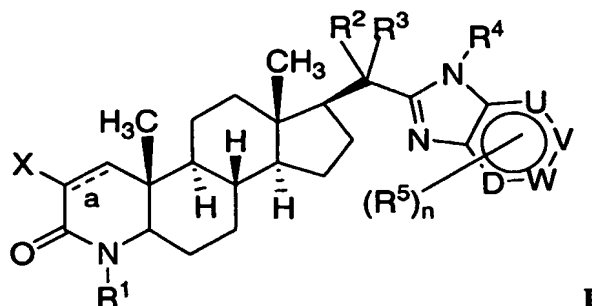


## WHAT IS CLAIMED IS:

1. A compound of structural formula I:



I

a pharmaceutically acceptable salt or a stereoisomer thereof,

wherein:

a is chosen from a double bond and a single bond;

X is hydrogen or halogen;

10 n is 0, 1, 2, 3, or 4;

U, V, W, and D are each independently chosen from CH, and N, provided that at least one of U, V, W, and D is CH;

R<sup>1</sup> is chosen from hydrogen, CF<sub>3</sub>, carbonyl(C<sub>1-3</sub> alkyl), hydroxyl, C<sub>1-4</sub> alkoxy, halogen, C<sub>1-3</sub> alkyl, hydroxymethyl, and (C<sub>0-6</sub> alkyl)<sub>2</sub>amino, wherein said alkyl and alkoxy are each optionally substituted with one to seven fluorine atoms;

15

R<sup>2</sup> and R<sup>3</sup> are each independently chosen from: hydrogen, halogen, C<sub>1-8</sub> alkyl, amino C<sub>0-6</sub>alkyl, C<sub>1-6</sub> alkylamino C<sub>0-6</sub>alkyl, (C<sub>1-6</sub> alkyl)<sub>2</sub>amino C<sub>0-6</sub>alkyl, C<sub>1-6</sub> alkoxy C<sub>0-6</sub>alkyl, hydroxycarbonyl C<sub>0-6</sub>alkyl, hydroxy C<sub>0-6</sub>alkyl, C<sub>1-6</sub> alkoxy carbonyl C<sub>0-6</sub>alkyl, hydroxycarbonyl C<sub>1-6</sub> alkyloxy, cyano, perfluoroC<sub>1-4</sub>alkyl, perfluoroC<sub>1-4</sub>alkoxy, C<sub>0-6</sub> alkylcarbonyl, C<sub>1-6</sub> alkylcarbonyloxy, C<sub>1-6</sub> alkylcarbonylamino, C<sub>1-6</sub> alkylsulfonylamino, C<sub>1-6</sub> alkoxy carbonylamino, C<sub>1-6</sub>alkylaminocarbonylamino, (C<sub>1-6</sub>alkyl)<sub>2</sub> aminocarbonylamino, and (C<sub>1-6</sub>alkyl)<sub>2</sub> aminocarbonyloxy,

20

and wherein

25 R<sup>2</sup> and R<sup>3</sup> together with the carbon atom to which they are attached can optionally form a C<sub>3-6</sub> cycloalkyl group, or an oxo group, and

R<sup>2</sup> and R<sup>3</sup> are each independently optionally substituted with one or more R<sup>6</sup>;

R<sup>4</sup> is chosen from: hydrogen, halogen, C<sub>1-10</sub> alkyl(carbonyl)<sub>0-1</sub>, aryl C<sub>0-8</sub> alkyl, amino C<sub>0-8</sub> alkyl, C<sub>1-3</sub> acylamino C<sub>0-8</sub> alkyl, C<sub>1-6</sub> alkylamino C<sub>0-8</sub> alkyl, C<sub>1-6</sub> dialkylamino C<sub>0-8</sub> alkyl, aryl C<sub>0-6</sub> alkylamino C<sub>0-6</sub> alkyl, C<sub>1-4</sub> alkoxyamino C<sub>0-8</sub> alkyl, hydroxy C<sub>1-6</sub> alkylamino C<sub>0-8</sub> alkyl, C<sub>1-4</sub> alkoxy C<sub>0-6</sub> alkyl, hydroxycarbonyl C<sub>0-6</sub> alkyl, C<sub>1-4</sub> alkoxycarbonyl C<sub>0-6</sub> alkyl, hydroxycarbonyl C<sub>0-6</sub> alkyloxy, hydroxy C<sub>1-6</sub> alkylamino C<sub>0-6</sub> alkyl, or hydroxy C<sub>0-6</sub> alkyl,

wherein R<sup>4</sup> is optionally substituted with one or more groups chosen from hydrogen, OH, (C<sub>1-6</sub>)alkoxy, halogen, CO<sub>2</sub>H, CN, O(C=O)C<sub>1-6</sub> alkyl, NO<sub>2</sub>, trifluoromethoxy, trifluoroethoxy, -O(<sub>0-1</sub>)(C<sub>1-10</sub>)perfluoroalkyl, and NH<sub>2</sub>;

R<sup>5</sup> is chosen from: halogen, (carbonyl)<sub>0-1</sub>C<sub>1-10</sub> alkyl, (carbonyl)<sub>0-1</sub>C<sub>2-10</sub> alkenyl, (carbonyl)<sub>0-1</sub>C<sub>2-10</sub> alkynyl, (carbonyl)<sub>0-1</sub>aryl C<sub>1-10</sub> alkyl, C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl, (C<sub>3-8</sub>)heterocyclyl C<sub>0-10</sub> alkyl, C<sub>1-4</sub>acylamino C<sub>0-10</sub> alkyl, C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl, di-(C<sub>1-10</sub> alkyl)amino C<sub>0-10</sub> alkyl, arylC<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl, (arylC<sub>0-10</sub> alkyl)<sub>2</sub>amino C<sub>0-10</sub> alkyl, C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl, C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl, (C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl)<sub>2</sub>amino C<sub>0-10</sub> alkyl, (C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkyl)<sub>2</sub>amino C<sub>0-10</sub> alkyl, C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl aminocarbonylamino, (C<sub>1-10</sub> alkyl)<sub>2</sub>aminocarbonylamino, (aryl C<sub>1-10</sub> alkyl)<sub>1-2</sub>aminocarbonylamino, C<sub>0-10</sub> alkyl aminocarbonylamino, C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkyl aminocarbonylamino, (C<sub>1-10</sub> alkyl)<sub>2</sub>aminocarbonyl C<sub>0-10</sub> alkyl, (aryl C<sub>1-10</sub> alkyl)<sub>1-2</sub>aminocarbonyl C<sub>0-10</sub> alkyl, C<sub>0-10</sub> alkyl aminocarbonyl C<sub>0-10</sub> alkyl, C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl aminocarbonyl C<sub>0-10</sub> alkyl, C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkyl aminocarbonyl C<sub>0-10</sub> alkyl, aryl C<sub>0-10</sub> alkyl aminocarbonyl C<sub>0-10</sub> alkyl,

(C<sub>1-10</sub> alkyl)<sub>2</sub>aminocarbonyl, (aryl C<sub>1-10</sub> alkyl)<sub>1-2</sub>aminocarbonyl,  
 C<sub>1-10</sub> alkoxy (carbonyl)<sub>0-1</sub>C<sub>0-10</sub> alkyl, carboxy C<sub>0-10</sub> alkylamino,  
 carboxy C<sub>0-10</sub> alkyl, carboxy aryl, carboxy C<sub>3-8</sub> cycloalkyl,  
 carboxy C<sub>3-8</sub> heterocyclyl, C<sub>1-10</sub> alkoxy, C<sub>1-10</sub>alkyloxy C<sub>0-10</sub>alkyl  
 5 C<sub>1-10</sub> alkylcarbonyloxy, C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkylcarbonyloxy,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkylcarbonyloxy, aryl C<sub>0-10</sub> alkylcarbonyloxy,  
 C<sub>1-10</sub> alkylcarbonyloxy amino, aryl C<sub>0-10</sub> alkylcarbonyloxy amino,  
 C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkylcarbonyloxy amino,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkylcarbonyloxy amino,  
 10 (C<sub>1-10</sub> alkyl)<sub>2</sub>aminocarbonyloxy, (aryl C<sub>0-10</sub> alkyl)<sub>1-2</sub>aminocarbonyloxy,  
 (C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkyl)<sub>1-2</sub>aminocarbonyloxy,  
 (C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub>alkyl)<sub>1-2</sub>aminocarbonyloxy,  
 hydroxy C<sub>0-10</sub>alkyl, hydroxycarbonylC<sub>0-10</sub>alkoxy,  
 hydroxycarbonylC<sub>0-10</sub>alkyloxy, C<sub>1-10</sub> alkylthio, C<sub>1-10</sub> alkylsulfinyl,  
 15 aryl C<sub>0-10</sub> alkylsulfinyl, C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkylsulfinyl,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkylsulfinyl, C<sub>1-10</sub> alkylsulfonyl,  
 aryl C<sub>0-10</sub> alkylsulfonyl, C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkylsulfonyl,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkylsulfonyl, C<sub>1-10</sub> alkylsulfonylamino,  
 aryl C<sub>1-10</sub> alkylsulfonylamino, C<sub>3-8</sub> heterocyclyl C<sub>1-10</sub> alkylsulfonylamino,  
 20 C<sub>3-8</sub> cycloalkyl C<sub>1-10</sub> alkylsulfonylamino, cyano, nitro, perfluoroC<sub>1-6</sub>alkyl, and  
 perfluoroC<sub>1-6</sub>alkoxy;

wherein R<sup>5</sup> is optionally substituted with at least one substituent, R<sup>6</sup>; and

R<sup>6</sup> is chosen from: halogen, (carbonyl)<sub>0-1</sub>C<sub>1-10</sub> alkyl, (carbonyl)<sub>0-1</sub>C<sub>2-10</sub> alkenyl,

(carbonyl)<sub>0-1</sub>C<sub>2-10</sub> alkynyl, (carbonyl)<sub>0-1</sub>aryl C<sub>0-10</sub> alkyl,  
 25 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl, (C<sub>3-8</sub>)heterocyclyl C<sub>0-10</sub> alkyl,  
 (C<sub>3-8</sub>)heterocycloalkyl C<sub>0-10</sub> alkyl, C<sub>1-4</sub>acylamino C<sub>0-10</sub> alkyl,  
 C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl, di-(C<sub>1-10</sub> alkyl)amino C<sub>0-10</sub> alkyl,  
 arylC<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl, (arylC<sub>0-10</sub> alkyl)<sub>2</sub>amino C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl,  
 30 C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> heterocycloalkyl C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl,

C<sub>0-10</sub> alkyl carbimidoyl C<sub>0-10</sub> alkyl, (C<sub>1-10</sub> alkyl)<sub>2</sub>aminocarbonyl,  
 C<sub>1-10</sub> alkoxy (carbonyl)<sub>0-1</sub> C<sub>0-10</sub> alkyl, C<sub>1-10</sub> alkyloxy C<sub>0-10</sub> alkyl,  
 (C<sub>1-10</sub> alkyl)<sub>2</sub>aminocarbonyloxy, hydroxycarbonyl C<sub>0-10</sub> alkoxy,  
 (C<sub>1-10</sub> alkyl)<sub>2</sub>aminocarbonyloxy, (aryl C<sub>0-10</sub> alkyl)<sub>1-2</sub>aminocarbonyloxy,  
 5 hydroxy C<sub>0-10</sub> alkyl, C<sub>1-10</sub> alkylsulfonyl, C<sub>1-10</sub> alkylsulfonylamino,  
 aryl C<sub>1-10</sub> alkylsulfonylamino, C<sub>3-8</sub> heterocyclyl C<sub>1-10</sub> alkylsulfonylamino,  
 C<sub>3-8</sub> heterocycloalkyl C<sub>1-10</sub> alkylsulfonylamino, perfluoro C<sub>1-6</sub> alkoxy,  
 C<sub>3-8</sub> cycloalkyl C<sub>1-10</sub> alkylsulfonylamino, cyano, nitro, and perfluoro C<sub>1-6</sub> alkyl,

wherein R<sup>6</sup> is optionally substituted with one or more groups chosen from: OH, NO<sub>2</sub>, (C<sub>1-6</sub>)alkoxy,  
 10 halogen, CO<sub>2</sub>H, CN, O(C=O)C<sub>1-C6</sub> alkyl, trifluoromethoxy, trifluoroethoxy, and -O(0-1)(C<sub>1-10</sub>)perfluoroalkyl.

2. A compound according to Claim 1, wherein X is fluorine.

15 3. A compound according to Claim 1, wherein X is hydrogen.

4. A compound according to Claim 1, wherein R<sup>1</sup> is chosen from: hydrogen, CF<sub>3</sub>,  
 hydroxyl, and C<sub>1-3</sub> alkyl optionally substituted with one to seven fluorine atoms.

20 5. A compound according to Claim 4, wherein R<sup>1</sup> is chosen from: hydrogen and  
 C<sub>1-3</sub> alkyl.

6. A compound according to Claim 5, wherein R<sup>1</sup> is methyl.

25 7. A compound according to Claim 6, wherein U, V, W, and D are each  
 independently chosen from CH and N, provided that at least two of U, V, W, and D are each CH.

8. A compound according to Claim 7, wherein R<sup>5</sup> is chosen from: halogen,  
 (carbonyl)<sub>0-1</sub> C<sub>1-10</sub> alkyl, (carbonyl)<sub>0-1</sub> C<sub>2-10</sub> alkenyl,  
 30 (carbonyl)<sub>0-1</sub> C<sub>2-10</sub> alkynyl, C<sub>1-10</sub> alkenylamino, (carbonyl)<sub>0-1</sub> aryl C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl, (C<sub>3-8</sub>)heterocyclyl C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> heterocycloalkyl C<sub>0-10</sub> alkyl, C<sub>1-4</sub> acylamino C<sub>0-10</sub> alkyl,

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- C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl, di-(C<sub>1-10</sub> alkyl)amino C<sub>0-10</sub> alkyl,  
 arylC<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl, (arylC<sub>0-10</sub> alkyl)<sub>2</sub>amino C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl,  
 5 C<sub>3-8</sub> heterocycloalkyl C<sub>0-10</sub> alkylamino C<sub>0-10</sub> alkyl,  
 (C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl)<sub>2</sub>amino C<sub>0-10</sub> alkyl,  
 (C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkyl)<sub>2</sub>amino C<sub>0-10</sub> alkyl,  
 (C<sub>3-8</sub> heterocycloalkyl C<sub>0-10</sub> alkyl)<sub>2</sub>amino C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl aminocarbonylamino, (C<sub>1-10</sub> alkyl)<sub>2</sub>aminocarbonylamino, (aryl C<sub>1-10</sub>  
 ) alkyl)<sub>1-2</sub>aminocarbonylamino, C<sub>0-10</sub> alkyl aminocarbonylamino,  
 C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkyl aminocarbonylamino,  
 C<sub>3-8</sub> heterocycloalkyl C<sub>0-10</sub> alkyl aminocarbonylamino,  
 C<sub>0-10</sub> alkyl carbonylamino C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl carbonylamino C<sub>0-10</sub> alkyl,  
 5 C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkyl carbonylamino C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> heterocycloalkyl C<sub>0-10</sub> alkyl carbonylamino C<sub>0-10</sub> alkyl,  
 (C<sub>1-10</sub> alkyl)<sub>2</sub>aminocarbonyl C<sub>0-10</sub> alkyl,  
 (aryl C<sub>1-10</sub> alkyl)<sub>1-2</sub>aminocarbonyl C<sub>0-10</sub> alkyl,  
 C<sub>0-10</sub> alkyl aminocarbonyl C<sub>0-10</sub> alkyl,  
 ) C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl aminocarbonyl C<sub>0-10</sub> alkyl,  
 C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkyl aminocarbonyl C<sub>0-10</sub> alkyl,  
 aryl C<sub>0-10</sub> alkyl aminocarbonyl C<sub>0-10</sub> alkyl, carboxy C<sub>0-10</sub> alkyl,  
 C<sub>1-10</sub> alkoxy (carbonyl)<sub>0-1</sub>C<sub>0-10</sub> alkyl,  
 C<sub>1-10</sub> alkylcarbonyloxy, C<sub>3-8</sub> heterocyclyl C<sub>0-10</sub> alkylcarbonyloxy,  
 5 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkylcarbonyloxy, aryl C<sub>0-10</sub> alkylcarbonyloxy,  
 aryl C<sub>0-10</sub> alkyl carbonylamino C<sub>0-10</sub> alkyl,  
 amino C<sub>0-10</sub> alkyl carbimidoylC<sub>0-10</sub> alkylamino,  
 C<sub>0-10</sub> alkylcarboxy C<sub>0-10</sub> alkylamino, C<sub>1-10</sub> alkyl(carbonyl)<sub>0-1</sub>oxyC<sub>0-10</sub> alkylamino, C<sub>3-8</sub>  
 heterocyclyl C<sub>0-10</sub> alkyl(carbonyl)<sub>0-1</sub>oxyC<sub>0-10</sub> alkylamino,  
 ) C<sub>3-8</sub>heterocycloalkylC<sub>0-10</sub>alkyl(carbonyl)<sub>0-1</sub>oxyC<sub>0-10</sub>alkylamino,  
 C<sub>3-8</sub> cycloalkyl C<sub>0-10</sub> alkyl(carbonyl)<sub>0-1</sub>oxyC<sub>0-10</sub> alkylamino,

aryl C<sub>0-10</sub> alkyl(carbonyl)<sub>0-10</sub>oxyC<sub>0-10</sub> alkylamino,  
C<sub>1-10</sub> alkylsulfonylamino, aryl C<sub>1-10</sub> alkylsulfonylamino,  
C<sub>3-8</sub> heterocyclyl C<sub>1-10</sub> alkylsulfonylamino,  
C<sub>3-8</sub> heterocycloalkyl C<sub>1-10</sub> alkylsulfonylamino,

- 5 C<sub>3-8</sub> cycloalkyl C<sub>1-10</sub> alkylsulfonylamino, cyano, nitro,  
perfluoroC<sub>1-6</sub>alkyl, and perfluoroC<sub>1-6</sub>alkoxy, and  
wherein R<sup>5</sup> is optionally substituted with at least one substituent R<sup>6</sup>.

9. A compound according to Claim 8, wherein R<sup>2</sup> and R<sup>3</sup> are each independently  
10 chosen from: hydrogen, halogen, C<sub>1-8</sub> alkyl, amino C<sub>0-6</sub>alkyl,  
C<sub>1-6</sub> alkylamino C<sub>0-6</sub>alkyl, C<sub>1-6</sub> alkoxy C<sub>0-6</sub>alkyl, hydroxycarbonyl C<sub>0-6</sub>alkyl, hydroxycarbonyl C<sub>1-6</sub>  
alkyloxy, hydroxy C<sub>0-6</sub>alkyl, C<sub>0-6</sub> alkylcarbonyl,  
C<sub>1-6</sub> alkylcarbonyloxy, C<sub>1-6</sub> alkylcarbonylamino, C<sub>1-6</sub> alkoxycarbonylamino,  
C<sub>1-6</sub>alkylaminocarbonylamino, and wherein  
15 R<sup>2</sup> and R<sup>3</sup> together with the carbon atom to which they are attached can optionally form a C<sub>3-6</sub> cycloalkyl  
group, or an oxo group, and  
R<sup>2</sup> and R<sup>3</sup> are each independently optionally substituted with one or more R<sup>6</sup>.

- 20 10. A compound according to Claim 9, wherein X is hydrogen.

11. A compound according to Claim 9, wherein X is fluorine.

12. A compound according to Claim 10, wherein at least two of U, V, W, and D are  
each CH.

25 13. A compound according to Claim 10, wherein U, V, W and D are each CH.

14. A compound according to Claim 3, wherein a is a double bond.

30 15. A compound according to Claim 1, selected from:  
and pharmaceutically acceptable salts and stereoisomers thereof.

16. A method for modulating a function mediated by the androgen receptor in a mammal in need of such modulation comprising administering a therapeutically effective amount of a compound of Claim 1 or a pharmaceutically acceptable salt or a stereoisomer thereof.

5 17. A method of activating the function of the androgen receptor in a mammal in need of such activation comprising administering a therapeutically effective amount of a compound of Claim 1 or a pharmaceutically acceptable salt or a stereoisomer thereof.

10 18. A method of Claim 16, wherein said function mediated by the androgen receptor is activated in bone or muscle tissue and blocked in the prostate or the uterus.

15 19. A method of treating a condition in a mammal which is caused by androgen deficiency, which can be ameliorated by androgen replacement, or which can be increased by androgen replacement, which condition is selected from weakened muscle tone, osteoporosis, osteopenia, glucocorticoid-induced osteoporosis, periodontal disease, bone fracture, bone damage following bone reconstructive surgery, sarcopenia, frailty, aging skin, male hypogonadism, postmenopausal symptoms in women, atherosclerosis, hypercholesterolemia, hyperlipidemia, obesity, aplastic anemia, hematopoietic disorders, arthritic condition and joint repair, HIV-wasting, prostate cancer, cancer cachexia, muscular dystrophies, Alzheimer's disease, cognitive decline, sexual dysfunction, sleep apnea, benign prostate hyperplasia, abdominal adiposity, metabolic syndrome, type II diabetes, depression, premature ovarian failure, and autoimmune disease comprising administering to the mammal in need of such treatment, a therapeutically effective amount of a compound according to Claim 1 or a pharmaceutically acceptable salt or a stereoisomer thereof.

25 20. A method according to Claim 19, wherein said condition is osteoporosis.

21. A method of treating osteoporosis in a mammal in need thereof, comprising administering a therapeutically effective amount of a compound according to Claim 1 or a pharmaceutically acceptable salt or a stereoisomer thereof.

30 22. A method of Claim 21, further comprising the administration of an agent selected from:

- 1) an estrogen or an estrogen derivative, alone or in combination with a progestin or progestin derivative,

- 2) a bisphosphonate,
- 3) an antiestrogen or a selective estrogen receptor modulator,
- 4) an  $\alpha_v\beta_3$  integrin receptor antagonist,
- 5) a cathepsin K inhibitor,
- 5 6) an HMG-CoA reductase inhibitor,
- 7) an osteoclast vacuolar ATPase inhibitor,
- 8) an antagonist of VEGF binding to osteoclast receptors,
- 9) an activator of peroxisome proliferator-activated receptor  $\gamma$ ,
- 10) calcitonin,
- 10 11) a calcium receptor antagonist,
- 12) parathyroid hormone or analog thereof,
- 13) a growth hormone secretagogue,
- 14) human growth hormone,
- 15) insulin-like growth factor,
- 15 16) a p38 protein kinase inhibitor,
- 17) bone morphogenetic protein,
- 18) an inhibitor of BMP antagonism,
- 19) a prostaglandin derivative,
- 20) vitamin D or vitamin D derivative,
- 20 21) vitamin K or vitamin K derivative,
- 22) ipriflavone,
- 23) fluoride salts,
- 24) dietary calcium supplement, and
- 25) osteoprotegerin.

25 23. The method according to Claim 22, wherein:

- 1) the estrogen or estrogen derivative, alone or in combination with a progestin or progestin derivative, is selected from conjugated estrogen, equine estrogen,  $17\beta$ -estradiol, estrone,  $17\beta$ -ethynyl estradiol,  $17\beta$ -ethynyl estradiol with at least one agent selected from  
30 norethindrone and medroxyprogesterone acetate;
- 2) the bisphosphonate is selected from alendronate, clodronate, etidronate, ibandronate, incadronate, minodronate, neridronate, olpadronate, pamidronate, piridronate, risedronate, tiludronate, and zoledronate;



- 3) the antiestrogen or selective estrogen receptor modulator is selected from raloxifene, clomiphene, zuclomiphene, enclomiphene, nafoxidene, CI-680, CI-628, CN-55,945-27, Mer-25, U-11,555A, U-100A, tamoxifen, lasofoxifene, toremifene, azorxifene, EM-800, EM-652, TSE 424, droloxifene, idoxifene, and levormeloxifene;
- 5 4) the HMG-CoA reductase inhibitor is selected from lovastatin, simvastatin, dihydroxy-open acid simvastatin, pravastatin, fluvastatin, atorvastatin, cerivastatin, rosuvastatin, pitavastatin, and nisvastatin;
- 5) calcitonin is salmon calcitonin administered as a nasal spray;
- 6) bone morphogenetic protein is selected from BMP 2, BMP 3, BMP 5, BMP 6, BMP 7, TGF  
10 beta, and GDF5;
- 7) insulin-like growth factor is selected from IGF I and IGF II alone or in combination with IGF binding protein 3;
- 8) the prostaglandin derivative is selected from agonists of prostaglandin receptors EP<sub>1</sub>, EP<sub>2</sub>, EP<sub>4</sub>, FP, and IP;
- 9) the fibroblast growth factor is selected from aFGF and bFGF;
- 10) parathyroid hormone (PTH) or PTH analog is selected from PTH subcutaneous injection, human PTH (1-84), human PTH (1-34), and other partial sequences, native or with substitutions;
- 11) vitamin D or vitamin D derivative is selected from natural vitamin D, 25-OH-vitamin D<sub>3</sub>,  
20 1 $\alpha$ ,25(OH)<sub>2</sub> vitamin D<sub>3</sub>, 1 $\alpha$ -OH-vitamin D<sub>3</sub>, 1 $\alpha$ -OH-vitamin D<sub>2</sub>, dihydrotachysterol, 26,27-F<sub>6</sub>-1 $\alpha$ ,25(OH)<sub>2</sub> vitamin D<sub>3</sub>, 19-nor-1 $\alpha$ ,25(OH)<sub>2</sub>vitamin D<sub>3</sub>, 22-oxacalcitriol, calcipotriol, 1 $\alpha$ ,25(OH)<sub>2</sub>-16-ene-23-yne-vitamin D<sub>3</sub>(Ro 23-7553), EB1089, 20-epi-1 $\alpha$ ,25(OH)<sub>2</sub> vitamin D<sub>3</sub>, KH1060, ED71, 1 $\alpha$ ,24(S)-(OH)<sub>2</sub> vitamin D<sub>3</sub>, and 1 $\alpha$ ,24(R)-(OH)<sub>2</sub> vitamin D<sub>3</sub>;
- 12) the dietary calcium supplement is selected from calcium carbonate, calciumcitrate, and natural calcium salts; and
- 13) the fluoride salts are chosen from sodium fluoride and monosodium fluorophosphate (MFP); and pharmaceutically acceptable salts or stereoisomers thereof.
- 30 24. The method according to Claim 23, wherein the bisphosphonate is alendronate monosodium trihydrate or alendronate monosodium monohydrate.

25. The method of Claim 22, wherein said agent is selected from:  
an estrogen or an estrogen derivative, alone or in combination with a progestin or progestin derivative, a  
bisphosphonate, an antiestrogen or a selective estrogen receptor modulator, an  $\alpha\text{v}\beta 3$  integrin receptor  
antagonist, a cathepsin K inhibitor,  
5 an osteoclast vacuolar ATPase inhibitor, calcitonin, osteoprotegrin, and parathyroid hormone or analog  
thereof.

10 26. A pharmaceutical composition comprising a therapeutically effective amount of  
a compound of Claim 1 and a pharmaceutically acceptable carrier.

27. A composition of Claim 26, further comprising an active ingredient selected  
from: an estrogen or an estrogen derivative, alone or in combination with a progestin or progestin  
derivative, a bisphosphonate, an antiestrogen or a selective estrogen receptor modulator, an  $\alpha\text{v}\beta 3$   
integrin receptor antagonist, a cathepsin K inhibitor, an HMG-CoA reductase inhibitor, an osteoclast  
15 vacuolar ATPase inhibitor, an antagonist of VEGF binding to osteoclast receptors, an activator of  
peroxisome proliferator-activated receptor  $\gamma$ , calcitonin, a calcium receptor antagonist, parathyroid  
hormone or analog thereof, a growth hormone secretagogue, human growth hormone, insulin-like growth  
factor, a p38 protein kinase inhibitor, bone morphogenetic protein, an inhibitor of BMP antagonism, a  
prostaglandin derivative, vitamin D or vitamin D derivative, vitamin K or vitamin K derivative,  
20 ipriflavone, fluoride salts, dietary calcium supplements, and osteoprotegerin.

28. A composition of Claim 27, wherein said bisphosphonate is alendronate.

25 29. A method of inhibiting bone resorption in a mammal in need thereof, comprising  
administering a therapeutically effective amount of a compound according to Claim 1 or a  
pharmaceutically acceptable salt or a stereoisomer thereof.

30 30. A method of increasing Bone Mineral Density in a mammal in need thereof,  
comprising administering a therapeutically effective amount of a compound according to Claim 1 or a  
pharmaceutically acceptable salt or a stereoisomer thereof.

31. A method of reducing the risk of vertebral or non-vertebral fractures in a  
mammal in need thereof, comprising administering a therapeutically effective amount of a compound  
according to Claim 1 or a pharmaceutically acceptable salt or a stereoisomer thereof.

32. A method of effecting a bone turnover marker in a mammal in need thereof, comprising administering a therapeutically effective amount of a compound according to Claim 1 or a pharmaceutically acceptable salt or a stereoisomer thereof, wherein said bone turnover marker is selected from urinary C-telopeptide degradation products of type I collagen (CTX), urinary N-telopeptide cross-links of type I collagen (NTX), DXA, and DPD.

33. A pharmaceutical composition made by combining a compound according to Claim 1 and a pharmaceutically acceptable carrier.

34. A process for making a pharmaceutical composition comprising combining a compound according to Claim 1 and a pharmaceutically acceptable carrier.

35. A method of treating or preventing an arthritic condition in a mammal in need thereof, comprising administering a therapeutically effective amount of a compound according to Claim 1 or a pharmaceutically acceptable salt or a stereoisomer thereof.

36. A method of Claim 35, wherein the arthritic condition is selected from rheumatoid arthritis and osteoarthritis.